

Application No. 10/804,332
Amendment dated January 10, 2006
Reply to Office Action of November 10, 2005

Docket No.: 60680-1894

REMARKS

Applicant has reviewed the Office Action and thanks Examiner Lopez for his careful review of the pending claims. In this Amendment, the specification has been amended to correct a typographical error in the description of the PEEK-HTTM composition. In addition, claim 11 has been amended to depend from claim 10 instead of claim 7.

New claims 12-14 have been added. Claim 12 depends from claim 1 and recites further details about the claimed polyaryletherketone polymer. Claim 13 depends from claim 6 and also recites further details about the claimed polyaryletherketone polymer. Claim 14 depends from Claim 10 and recites similar limitations. The new claims are fully supported by the original specification, and no new matter has been added.

No claims have been canceled. Thus, claims 1-14 remain pending.

Claim Rejections Under 35 U.S.C. § 112

Claim 11 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Due to a typographical error, original claim 11 recited claim 7 as the base claim from which it depends. Claim 11 has been amended to recite claim 10 as its base claim. As amended, claim 11 and claim 10 both recite methods for reducing microwelding. Claim 11 is therefore definite, and the rejection is moot.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-11 stand rejected under 35 U.S.C. § 103 as obvious over Frame, U.S. Patent No. 5,713,324 in view of Sakata, U.S. Patent No. 5,750,266. According to the Examiner, Frame discloses an aluminum grooved piston in a steel cylinder, wherein a piston ring coated with PTFE is disposed in the groove. While conceding that Frame does not disclose polyaryletherketone polymer coated piston rings—as claimed by Applicant—he asserts that Sakata teaches the equivalence of polyaryletherketone and PTFE piston ring coatings.

The rejection is respectfully traversed. “To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” *In re*

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Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).” See also *Litton Systems, Inc. v. Honeywell, Inc.*, 87 F.3d 1559, 1569 (Fed. Cir. 1996) (rejecting defendants’ obviousness challenge on the grounds that “[t]he prior art simply does not contain may limitations contained in the claimed method”); *Manual of Patent Examining Procedure* (MPEP) at § 2143.03. Neither reference discloses or suggests piston rings *coated* with a polyaryletherketone polymer. Moreover, neither reference discloses the use of polyaryletherketone materials for *piston* rings—as a coating or otherwise.

First, each of the pending claims recites a structure wherein either a piston ring or a piston groove has a surface that is *coated* with a composition of a polyaryletherketone polymer (claims 1-9, 12 and 13) or a surface on which that composition is deposited (claims 10, 11 and 14). Sakata does not disclose or suggest polyaryletherketone polymer *coatings* for piston rings or the deposition of such compositions on the surface of a piston ring. Instead, its seal rings are made by extruding or injection molding PEEK and/or polyether nitride. See Sakata at 2:12-17. Contrary to the Examiner’s assertion, Sakata does not indicate that polyaryletherketone polymer coatings are equivalent to the PTFE coatings described in Frame. To obtain the claimed invention, the references of record would have to be modified in a manner that is not suggested by the prior art. See *Ex parte Dussaud*, 7 USPQ2d 1818, 1820 (Bd. App. & Int’f 1988) (“The mere fact that the prior art could be modified in the manner proposed by the Examiner would not have made the modification obvious unless the prior art suggested the desirability of the modification”); see also *In re Laskowski*, 871 F.2d 115, 117 (Fed. 1989). For this reason alone, Applicant’s claims are allowable over the combination of Frame and Sakata.

Second, neither Frame nor Sakata discloses the use of polyaryletherketone materials—as coatings or otherwise—for *piston* sealing rings. Sakata is entitled “Sliding Materials for Light Metal Materials.” Sakata only mentions the use of the disclosed sealing rings to seal *rotatable shafts*, not pistons. For example, in his Background of the Invention, Sakata discusses “oil leakage . . . when the seal rings made of cast iron material were fitted into ring grooves formed on a *rotatable shaft* made of ADC-12Z.” Sakata at 1:20-24 (emphasis added). In addition, the only wear testing described in Sakata involves rotatable shafts—not pistons:

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In the test apparatus, the predetermined pressure P is applied to the disc holder 1 so as to press the disc 2 of aluminum based alloy against the test piece 5. While applying the pressure P the test piece holder 5 is *rotated* at a fixed rate and oil is supplied to the sliding surfaces between the test piece 5 and the disc 2.

Sakata at 4:8-13.

Similarly, the test apparatus of Sakata's Figure 8 uses a "rotatable shaft 7 . . . with a pair of annular grooves 8, 8 in which seal rings 9, 10 are fitted." Sakata at 5:51-52. Because none of the references of record disclose or suggest a piston ring coated with a polyaryletherketone polymer, they do not render the claimed invention obvious. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974); *Litton Systems, Inc. v. Honeywell, Inc.*, 87 F.3d 1559, 1569 (Fed. Cir. 1996); *Manual of Patent Examining Procedure* (MPEP) at § 2143.03.

Further, Sakata does not deal with pistons, one of ordinary skill in the art would not be motivated to combine its teachings with those of Frame. See *Winner International Royalty Corp. v. Wang*, 202 F.3d 1340, 1348 (Fed. Cir. 2000) (citations omitted) ("When an obviousness determination is based on multiple prior art references, there must be a showing of some teaching, suggestion, or reason to combine the references"). "The absence of such a suggestion [to combine references] is dispositive in an obviousness determination." *Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579 (Fed. Cir. 1997).

Independent claim 6 recites further limitations which distinguish it from the references of record. As mentioned above, Sakata only deals with reciprocating shafts used "to prevent leakage of oil supplied to the hydraulic circuit." Sakata at 1:7-8. However, claim 6 recites the use of the a polyaryletherketone coating on a piston ring for "a piston adapted to reciprocate within the combustion chamber of an engine." Nowhere does Sakata suggest polyaryletherketone materials for *combustion chamber* piston rings. Thus, the specific piston application recited in claim 6 further distinguishes it from Sakata.

Several of the dependent claims recite additional features which are independently patentable over the combination of Frame and Sakata. For example, claim 2 recites a structure "wherein only said piston groove engagement surface is coated with" a polyaryletherketone

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polymer. Similarly, claim 11 depends from claim 10 and recites "depositing said composition only on a bottom portion of said piston ring." Because Sakata's rings are extruded from PEEK materials, they necessarily lack the structure of claim 2 and cannot be made by the method of claim 11. In addition, claims 4 and 5 recite a piston ring comprised of cast iron and steel and coated with a polyaryletherketone polymer. The references of record do not disclose or suggest such a structure.


CONCLUSION

In view of the foregoing, reconsideration and withdrawal of the rejection are respectfully requested.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. 60680-1894 from which the undersigned is authorized to draw.

Dated: January 10, 2006

Respectfully submitted,

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